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U. S. DEPARTMENT OF AGRICULTURE.

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COÖPERATION

OF THE

DEPARTMENT OF AGRICULTURE

WITH THE

EDUCATIONAL FORCES

IN THE

UNITED STATES

RELATING TO AGRICULTURE.

BY

EDWIN WILLITS,  
ASSISTANT SECRETARY OF AGRICULTURE.

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FROM THE REPORT OF THE SECRETARY OF AGRICULTURE FOR 1891.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1892.



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SPECIAL REPORT OF THE ASSISTANT SECRETARY.

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SIR: I have the honor to submit the following article, which, in accordance with your request, has been prepared for insertion in your Annual Report, upon the coöperation of the Department of Agriculture with the educational forces in the United States relating to agriculture.

Very respectfully yours,—

EDWIN WILLITS,  
*Assistant Secretary.*

Hon. J. M. RUSK,  
*Secretary.*

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**COÖPERATION OF THE DEPARTMENT OF AGRICULTURE WITH  
THE EDUCATIONAL FORCES IN THE UNITED STATES RELATING  
TO AGRICULTURE.**

Agriculture is and probably always will be the largest single industry in the United States. This being so, it is natural to suppose that the forces in its promotion lead those of any other industry, and such is the case. They take almost every form and direction, but in no form or direction do they show this prominence in a greater degree than in what may be termed the educational; that is, in the effort to instruct and increase the intelligence of its workers in the capacities, operations, contingencies, and scope of the industry. In the first place we will briefly consider

**THE GENERAL FIELD.**

This general survey will naturally divide itself into four divisions: (1) Those forces that are in whole or in part fostered by the National Government; (2) those sustained in whole or in part by the several States, and localities; (3) those organizations of a voluntary character; and (4) the press and the literature specially devoted to agricultural subjects. In many cases the lines of separation are not clearly defined and the divisions in some degree overlap, but the main divisions are subject to this classification, and will without much forcing comprehend all we propose to discuss in this article.



## FORCES FOSTERED WHOLLY OR IN PART BY THE GENERAL GOVERNMENT.

These forces are again to be subdivided into three: (a) The Department of Agriculture; (b) the Agricultural Colleges; and (c) the Experiment Stations. Before proceeding to discuss the matter further it may be well to define the scope to be included in the term "educational." Every investigation that has for its purpose a better or more economical operation; a better or more perfect understanding of the capacities of soil or climate; a more thorough knowledge of the character and qualities of food, both for plants and animals, and its best adaptation to nutrition; more practical information as to the nature and character of diseases incident to vegetable and animal life and how to prevent or cure them, and as to noxious insects and how to destroy them; a fuller comprehension of the law of supply and demand, with information as to their ratio up to date; a more extended trial of the adaptability to our soil and climate of new and improved varieties of seeds and plants and animals from foreign shores or from different localities in our own vast domain with its many conditions—in short, every study, investigation, or experiment that has for its purpose "the how, the what, and the why" of agriculture is, in its essence and in its outcome, in its germ and its fruitage, educational. We propose, then, to follow broad lines in our classification and discussion.

*The Department of Agriculture.*—In view of the foregoing definition, this Department is the most momentous single educational force in the United States. Referring to my contribution to the Annual Report of 1890 on "The Scientific Work of this Department in its relation to Practical Agriculture," to those who may desire details, we may be pardoned for a brief summary of the article in order to illustrate the proposition or statement. Its publications include the Annual Report, of 600 pages, of which there were distributed 400,000 copies; special reports like that recently issued on the "Diseases of the Horse," of which there were published 140,000 copies; three regular monthly publications, Insect Life, Experiment Station Record, and the Statistical Report, and one quarterly, The Journal of Mycology; bulletins on the sugar beet, on sorghum and sugar cane, and experiments in the manufacture of sugar; other bulletins from the Divisions of Chemistry, Entomology, Botany, Forestry, Pomology, Horticulture, Microscopy, Ornithology and Mammalogy, and Vegetable Pathology, and from the Office of Experiment Stations; and the reports of the Weather Bureau and the Bureau of Animal Industry—all with editions ranging from 3,000 to 25,000 and from 25,000 to 150,000 copies. These reports and bulletins, supplemented by circulars on many topics, cover almost every subject included in agricultural study, and are based upon thorough and profound investigations and application by a corps of zealous, practical scientists, whose reputation is high in the scientific world and in the domain of practical agriculture. Almost without an exception the editions, large



as some of them are, fail to reach the demand. The simple statement of these facts would seem to substantiate the proposition that this Department is the most momentous single educational force in the United States—it may be justly said, in the world. There is nothing equal to it or like it in any other country.

For these publications Congress appropriates, for the current year, nearly \$400,000; and for the work, \$2,320,153, including \$879,753 for the Weather Bureau, transferred to this Department July 1, 1891.

*The Agricultural Colleges.*—Next to this Department stand these institutions, for, though separate, they are practically a unit, a system, a single force, supported in whole or in part by the National Government. In every State and Territory of the United States, except Montana and Idaho (excluding Alaska and the Indian country), there is such a college or an agricultural department in an existing institution which is the beneficiary of the Government—forty-three in all. In eleven of the States there are two, making in the aggregate fifty-four institutions projected on the same plan, and constituting, as said before, practically a single educational force. In a technical sense they are more educational than is this Department, for their prime purpose is to give instruction to students in the sciences relating to agriculture and the mechanic arts, including a more or less extended course in branches generally obtaining in other colleges, and in military tactics—none of which does this Department attempt to do. But in the broad field of the work of this Department they occupy a large space, and in connection with the experiment stations, to be referred to hereafter, they are sensibly invading our lines in some directions, and are in other directions occupying grounds from which we are prohibited, and which in the nature of the case we can not occupy. These institutions are in most instances largely supported by their respective States, especially in the construction of their buildings and the purchase of the farms connected therewith.

The endowment from the United States was created by two acts of Congress, both popularly called the Morrill acts (for their chief promoter, Hon. Justin S. Morrill, United States Senator from Vermont), the first dated July 2, 1862, and the other August 30, 1890. Under the first act Congress donated to each State 30,000 acres of the land, or the scrip for the same, for each Senator and Representative in Congress from that State. These lands and scrip were to be sold by the several States, and the proceeds of such sale were to be held in trust by them for the perpetual endowment of these colleges as unimpaired principal at an annual rate of not less than 5 per cent interest. Some of the States pay 7 per cent. This principal was recently stated at \$10,000,000, and the same high authority states that some of these colleges show a “higher average of endowment than any other class of institutions in the country except theological schools.” This statement was made prior to the passage of the act of August 30, 1890, by which each State is entitled to

receive for the benefit of such college, out of the proceeds of the sale of the public lands, the first year \$15,000, and in each succeeding year an additional \$1,000, till the sum shall reach \$25,000, after which the sum shall continue at that figure. These colleges are receiving the current year \$17,000 each from this fund. Some of the States have not complied as yet with the requirements of the act, but in the present year forty-two States and Territories are recipients, making an aggregate appropriation of \$714,000. Surely this increase of annual income must place some of these colleges on a higher average endowment than even the theological schools, heretofore referred to, even without the \$5,000,000 which it is estimated the States and individuals have contributed towards their equipment and support. They employ nearly or quite eight hundred professors and teachers, and have over ten thousand students. But Government aid does not end here. Accordingly there is to be added our last subdivision, to wit:

*The Experiment Stations.*—Each of these is in fact an integral part of the college connected with it. At this date there are forty-seven of them. Under the act of Congress approved March 2, 1887, commonly called the "Hatch act," (for its chief promoter, Hon. William H. Hatch, Representative in Congress from Missouri), the sum of \$15,000 is given annually to each State which shall establish an experiment department in connection with the agricultural colleges and departments named in the preceding subdivision, and the department is called an experiment station. The forty-seven stations are being paid this year \$700,000, besides an allotment to Oklahoma Territory for the same purpose. This Government aid is supplemented in many of the States by considerable appropriations. The experiments conducted therein are wide in their scope, and much the same as those carried on in this Department, adapted to the conditions and special wants of the localities in which they are situated, and with the further advantages and opportunities, denied to this Department, of having connected with them farms, orchards, and gardens upon which to carry on field experiments, and barns and buildings, as well as stock of all kinds, to enable them to carry on extensive tests in feeding and dairying. This is an educational force of the highest and most concrete form, employing four hundred and fifty workers in all branches of inquiry relating to agriculture, issuing bulletins to 350,000 persons, besides furnishing items and data on agricultural topics for hundreds of newspapers and periodicals in their respective States.

To recapitulate the appropriations by the Government, exclusive of the \$400,000 for printing:

For the Department of Agriculture.....	\$2, 320, 153
Interest on college endowment, first Morrill bill (estimated).....	500, 000
Direct appropriation under second Morrill bill.....	714, 000
Appropriations for experiment stations.....	708, 000
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Total annual appropriation by the Government for this great educational force. ....	4, 242, 153

## THE FORCES SUSTAINED IN WHOLE OR IN PART BY THE STATES.

These have been alluded to under a previous head. These agricultural colleges have been endowed by the States to the extent of \$5,000,000, and the experiment stations are to a greater or less degree so aided. In addition, there are several experiment stations endowed and supported entirely by them, and many institutions not heretofore enumerated, in which agriculture is taught. All institutions of learning in which scientific branches are traversed have a bearing, direct or remote, on this great industry. Agriculture is akin to almost every science; closely related to all, second cousin to none. Science walks the furrow with the farmer, is at his elbow as he casts forth his seed, aids him in gathering his crop, rides with him to a speedy market, and suggests avenues to spend his modest earnings. It would be difficult indeed to find an institution of learning that did not contribute in some degree to his comfort, intelligence, or prosperity; hence in a measure all such endowed by the State or its citizens might be remotely included in our classification. But only those agencies are under discussion which are specially established or conducted in the interest of agriculture. There are other agencies besides those heretofore particularly mentioned which in a measure owe their existence to State aid, but which in a large degree are carried on by the gratuitous services or individual contributions, which it was thought proper not to include in this place, but to classify with the next division.

## ORGANIZATIONS OF A VOLUNTARY CHARACTER.

These are in names and numbers almost too numerous to mention in this connection. Some of them, like State Boards or Commissioners of Agriculture, and Farmers' Institutes and Fairs, are organized under State law and draw an income from the State treasury, but, after all the labors and duties connected therewith, are in large proportion without adequate compensation—volunteer contributions for the general good. These organizations cover almost every phase of agricultural interest, and are national, State, district, county, and in many cases township in the scope of their action and jurisdiction.

The records of this Department, necessarily incomplete, as these bodies change from year to year, show that of national organizations there are 122, of which the following is a list, as classified:

## NATIONAL AGRICULTURAL ORGANIZATIONS.

General in scope:	
Department of Agriculture, Farmers' Congress, Association of Colleges and Stations .....	3
Orders:	
Like the Grange, Alliance, etc .....	7
Educational societies:	
Farmers' Progressive Club, Farmers' Institute .....	2
Horticulture:	
American Horticultural Society, Pomological Society, Gulf State Fruit-Growers' Association .....	3



Growers of special products:	
Sugar-growers, florists, seedsmen, etc .....	7
Miscellaneous:	
Fair associations, etc .....	5
STOCK ASSOCIATIONS.	
Horses:	
General in scope: Trotters, pacers' associations .....	3
Special-breed associations .....	12
Miscellaneous .....	2
Jacks and jennets .....	1
Cattle:	
General in scope: Cattle-Growers' Association, etc .....	3
Special breed associations: Shorthorn, Jersey, etc .....	16
Miscellaneous: Fat stock, herdbooks, etc .....	4
Sheep:	
General in scope: Wool-growers, etc .....	2
Associations by the breeders of the several kinds .....	18
Swine:	
General associations .....	2
Special associations .....	10
Dairy:	
General societies .....	8
Veterinarians .....	3
MISCELLANEOUS.	
Poultry:	
General organizations .....	2
Special breeders' societies .....	3
Bees .....	3
Fish .....	2
Silk .....	1
Total .....	122

STATE ORGANIZATIONS, MADE UP OF DELEGATES FROM THE SUBORDINATE GRANGES,  
ALLIANCES, OR BODIES OF THE ORDER.

These subordinate associations run up into the thousands, each with a membership that runs up into the hundreds, and all making compact, systematic orders or associations for the consideration of such matters as may be of special interest to agricultural industry, and which increase and cultivate the intelligence of the individual members. A short consideration of this feature of their work will reveal the fact that there is within the bounds of these lodges a power that is of great moment to agricultural interests. Each subordinate association as a rule covers within the scope of its labors a line of study and discussion of historical and literary matters. Each association is a debating club, with the usual literary exercises, with music, and the highest development of social life according to the standards of the respective communities which they represent. Their meetings, in some cases weekly, generally monthly, are looked forward to with interest, and the programme for each is a matter of earnest discussion and judicious deliberation. Meeting as they do for a specific purpose, which purpose is sedulously carried out, it may be readily conceived that the result can scarcely be otherwise than salutary. Generally one or more persons are connected with each club or association who are recognized as intellectual and literary leaders, usually persons of more than ordinary education and of great force of character. There are other matters, of course, that

are subjects of discussion besides the merely educational and intellectual subjects which traverse the broad lines of the interests of agriculture, national, State, and local. Matters of legislation in some cases are the prime topics of consideration, but in so far as political questions are concerned this article will not consider them beyond the statement that any discussion of matters of legislation, however crude it may be, must lead to a higher appreciation of the duties of a citizen, and to a more intelligent scrutiny of the acts and votes of their representatives in national or State legislatures. But taking a general survey of the whole field occupied by these thousands of subordinate associations, one can not fail to be struck with the increase of knowledge among the people, which may be attributed to a considerable extent to their influence. The personal observation of the writer while for many years acting in a representative capacity most strongly confirmed him in the statement that they are highly educational in their character. During the years that it was his duty and his pleasure to appeal to the intelligence of the people he was struck with the constant advance in their appreciation of public questions and the general development and interest in more purely intellectual and literary pursuits. Within this sphere specially under his observation he felt this fact so sensibly that he often remarked that there had been an advance of at least 25 per cent in these respects. So long as these associations are confined to these worthy objects there are few more potent forces extant in the education of the people. Association always breeds inspiration, inspiration increases activity, and activity accomplishes results. Properly directed these associations are productive of great good, not only for agriculture, but for the general interests of the people. They demonstrate to the farmers themselves the benefits of organization.

Besides these orders there are clubs and associations, special in their character, that have great import to the interest that forms the nucleus of the association. Every convocation of people for the discussion of breeds of cattle, sheep, swine, and other domestic animals fosters intelligence and conduces to the higher education of the one hundred and twenty-two national organizations. The branches respectively enumerated above have, besides their State, their local organizations, all working for a common interest and with definite aim. The highest intelligence, scientific and otherwise, is to be found in them. The making of a herdbook has behind it as much intelligence as the framing of a constitution, differing only in character.

The results of the labors of all the foregoing organizations are national, permeating down through every avenue of commerce, of legislation, and of education; instructing the people, developing special industries, clamoring for rights, discussing principles, and shaping public sentiment. It is a tremendous educational force; in a certain sense discordant and undisciplined, but rudely effective. The student who should ignore this one in writing up the national forces would lack

one of the most essential elements of modern society. One does not need to be a demagogue who comprehends the vigorous activity of this force. True statesmanship must recognize it.

This article would be incomplete were not some consideration given to the influence of the Farmers' Institute. This organization is of comparatively recent date. As a rule, it is not under the jurisdiction of any order, club, or association, but is an organization in which all are associated, and which represents in a certain sense the public at large. In many States they are fostered by contributions from the State treasury, but even in these cases, as before stated, the labor done in them is purely voluntary. Beginning with a few in each State, they have developed in some States until every county, at least every district, is impelled to have its own, aside from those under State auspices. The best talent obtainable in the locality has assigned to it a portion of the programme. Colleges contribute from their laboratories whatever of light science can display; and side by side, theory and practice, experiment and experience, fact and fancy, enlighten and amuse the community. Halls are inadequate to accommodate the crowds, and what the newspaper does at the fireside is supplemented by the speaker on the platform. No age, no cause, has yet been able to dispense with oratory. To-day, as well as in the past, the personality of the speaker earnestly moved by his topic can impress his hearers as can no writer with his printed page. The institute fills this gap in the educational force. In some States it is the most manifest and powerful element in the discussion of agricultural subjects. Institutes have been designated the "people's colleges," in which are discussed the most abstruse principles in a popular way. They have been known to shape the agricultural policy of a whole community. They have shown what a special agricultural industry needs to make it a success. They have encouraged, as in no other way could it so successfully be done, the flagging energies of the almost hopeless worker. They have thrown light upon and suggested the remedy for some disability, and have shown a way of escape from some mysterious malady to plant and animal. They have helped to fight the pest so that fruitage shall be complete and perfect. In other words, all along the line of these institutes, following in their footsteps, we find reanimated hope, inspired courage, increased product, and value received. Some of the States still lack such organizations. They are most deplorably deficient in the very quarter that would promise them the most sensible relief. As a result each farmer goes his own way in the old paths, without conference with his neighbor and consideration of the experience of others, and without a knowledge of what other localities are doing and why they are attaining higher success. It is to be hoped that in the near future every State in the Union will have a systematic, well-devised, thoroughly equipped line of institutes, and that all over the land the best intelligence, the readiest speakers, and the most learned students may be drafted into the service of agriculture.



## THE PRESS AND THE LITERATURE SPECIALLY DEVOTED TO AGRICULTURE.

The records of this Department show that there are three hundred and thirty newspapers and publications devoted specially to agriculture. There are besides at least three hundred newspapers, many of which are leaders of public thought, and of large circulation, which have special departments or issues devoted exclusively to agricultural subjects. These newspapers, departments, and issues are in charge of energetic, forceful, intelligent men, with keen discrimination and loyalty to the interests they subserve. Within the last few years, such has been the development of agricultural inquiry, so much has its importance increased in public estimation, that the leading literary monthlies of the country have yielded to the demand of allotment of a portion of their space to articles prepared by persons who, from special study, are fitted to illustrate some phase of the great subject. The laboratory and the field are drawn on for illustrations. The sharpest pens, the most accomplished scholars, and the most earnest workers are now enlisted in favor of agriculture. These publications, in one form or another, reach almost every home in the land. They are read by the fireside, and the information and instruction contained in them find expression on the forum in every agricultural assemblage. Much has been said, and justly said, about the power of the press in molding public opinion and in educating the people. We have made the statement that no single industry in the United States has a greater educational force back of it than has agriculture. No other single industry has three hundred and thirty newspapers and publications specially devoted to its cause. Some of these newspapers have a large circulation, and become heirlooms in the family from generation to generation. The weekly and monthly visitant for the child becomes the weekly and monthly visitant for the man, and for his children after him. The farmer in these days that takes no agricultural newspaper—in these days of sharp competition, of overproduction in certain lines, and of specialties in all—will most certainly fall behind. Every successful farmer in these days must exercise judgment and skill, and his ready assistant and most complete handbook is the well-edited, comprehensive agricultural newspaper, which shall give market prices for his products, as well as information how best to produce them. Items of experience, discussions of principles that the best experience of ages have established, drawn from the world at large as well as at home, find their places in the columns of the newspaper. Facts as to processes, information as to improvements and scientific principles, are placed side by side with current news relating to products at home and abroad.

While a large portion of this agricultural press covers the whole ground of agricultural inquiry, there is a considerable portion that is devoted to specialties, such as to stock of various kinds and the various



industries incident thereto; and in fact there is hardly an association named in the foregoing list of national associations that has not one or more special organs devoted to its interests, in which the latest information with regard to these interests is given, and in which matters most significant and profitable to them are discussed. In short, this power of the press is one of the greatest unclassified, and in a certain sense intangible, forces connected with agriculture.

More progress has been made, perhaps, in coöperation between the Department of Agriculture and the press than in any other direction, for the reason, no doubt, that it presents the least difficulty. All that the press asks is to be promptly informed of all matters of general interest pertaining to the work of the Department. Under the present administration every effort has been made to meet this obvious obligation towards the press of the country. In a general way this effort to spread information through the most natural channel, the press, has been fully appreciated, but yet, strange as it may seem, even in the performance of a duty so obviously simple, the Department has been confronted with some singular criticism, it being occasionally accused of seeking by this means to influence public opinion in its favor, or in favor of some of its investigators, and this, in spite of the fact that the effort has been made in conveying information to give simply statements of fact, without any bias whatever; and that the facts being given to the papers for their own use, they were at liberty to present them to their readers in their own language, or to omit them entirely. Such objections have, however, been exceptional, the appreciation of our work on this line general, and the results, especially in the way of securing timely and well-directed distribution of needed information, so satisfactory as to justify not only a continuance of this plan of work, but the enlargement of its scope as occasion offers.

In this general survey of the field many important factors have been omitted, and many essential elements have not been discussed, but the facts stated and the classification considered can not fail to impress us all, to some degree, at least, with the immense power of the educational forces back of agriculture. They are diverse, in many cases discordant. They are like an undisciplined army, without coherence, without community, shorn of a large measure of its power, but full of energy, vitality, and loyalty to the great industry. How can these forces be marshaled into a more effective, less wasteful energy? Is it available to any leadership that shall not be despotic, autocratic, and destructive to any of the elements? Is it possible to agree upon some plan that shall at the same time indicate and establish the great highways of the movement, and shall still retain the minor paths of individual action? We approach this part of our subject with reluctance, yet feeling the necessity of some consideration of it, and with the hope that we shall not be charged with temerity in its discussion.

## COÖPERATION OF THE FORCES.

To a certain extent there is coöperation already. The forces intermingle. Each in a measure is tributary to the others and draws from them. The practical man is indebted to science for some of his best results. Many of the theories of science are exploded when put to the test of practical experience. Along what lines can the coöperation of all these forces be best projected? What shall be the division of work? What aid shall each render to the other?

We have shown briefly what the Department is, and what it is doing, or what are its contributions to this great educational force. Along what lines can it be still further projected, so that in its coöperation with other forces it may become further entitled to leadership, and this in a large measure without any legislation—that is, without any legislation enforcing leadership?

First, it will be agreed in all quarters that the Department has primary jurisdiction over matters which are general to the whole country, and which it can better perform than any other agency; and that it should not, except incidentally, cover the ground that can be as well covered by other agencies.

## MATTERS GENERAL TO THE WHOLE COUNTRY.

No individual or locality, were each working for himself or itself, can fully comprehend the influences of other individuals and localities. For instance, no mere local observer of the weather in any specific locality can have the means to obtain information as to the approach of a blizzard from Manitoba, and when it would be likely to reach his station. The broad general sweep of the storm, the elaborate discussion of climate and its effect upon vegetation, must largely be placed in the hands of the agent that considers the whole country. The spread of a disease, the transcontinental movement of a pest, the forewarning of a cold wave, must of necessity be in the hands of a department that represents the whole. Each may do his work in his specific locality, and contribute to the knowledge of the general agent, but the prime agent must be the one who considers the whole subject. There may be as much intelligence in the locality as in the general department, but this intelligence is only local, and is of no general benefit until considered and classified with the intelligence from other localities by the general agent. Again, every matter that is of interstate import must from the necessity of the case be under the control, in so far as its bearing upon the several States is concerned, of the General Government. Every agricultural subject that in any way impinges upon the commerce between the States must in its general scope be assigned also to the General Government. The regulations by which a contagious disease, liable to be transmitted from State to State by commercial transit, is controlled should be made by general authority. No locality acting

for itself can attempt to regulate it without impairing the rights of the whole body politic. All matters that relate to the proper inspection of commodities exported or imported should of necessity be relegated to the same authority. No further illustration on this point is needed. This division of powers inheres in the constitution and in the nature of the case, and while investigations and legislation in many of these matters may be made concurrently by localities, the whole subject in all its bearings must be considered authoritatively by the Department of Agriculture.

WHAT THE DEPARTMENT CAN BETTER PERFORM THAN ANY OTHER AGENCY.

It can collect and classify and exhibit and study the cereals, the forage plants, the fruits, the useful plants, and the fibers, animal and vegetable, of the whole country to better advantage than any single locality. Its agents are everywhere, its information is continental, or should be, its appliances are more extensive, and it has the advantage of the coöperation and contribution of the coördinate Departments of the Government. It, moreover, has the advantage of ready accessibility to foreign lands through the representatives of the Government in foreign nations. It can best study the general effects of climate in the distribution of plants and animals. It can best determine along what lines general experiments, whose effects are generic, should be conducted. As an established agent of the Government it is at hand to take upon itself any special duties assigned to it by Congress. Being beyond the influence of local interests, it can be impartial in its decision of agricultural results. It can be the most effective agent in the collection of agricultural statistics at home and abroad. It can best be the repository of information, past and current, relating to all the varied topics of agricultural import. It can best supervise, within proper limitations, and advise generally the expenditure of all moneys appropriated by Congress for the benefit of agriculture, whether given to the Department or contributed to the States for that purpose. It can best understand and administer relief to the wants of the whole country. It can best collect, purchase, and distribute new and improved seeds and plants, with a knowledge of their adaptation to all the several localities and climates and soils of the country. In other words, from its situation, the means and agencies at its disposal, and the subjects it can generically handle, the Department of Agriculture can be, properly organized and supported, essentially an authority along the lines above indicated.

WHAT THE DEPARTMENT SHOULD NOT DO EXCEPT INCIDENTALLY.

It has not been the policy of the Department in later years, though the contrary has had its advocates, to carry on an experimental farm to propagate and test fruits, cereals, fibers, or flowers. The reason for



this policy is the fact that the Department has but one locality and one line of climatic conditions, whereas the country at large has many, and tests made here would be valuable only for like conditions of soil and climate. This policy remits all that class of experiments in a large degree to the experiment stations and the intelligent experimental farmers, horticulturists, and florists of the country. It is not desirable that the Department should carry on dairy farms or experiments in feeding live stock, for much the same reasons as the foregoing; but it is desirable that the Department should canvass the principles, should become the general repository of information, should be competent to give advice in all these lines when called for, and that it should make, as before stated, a special study of the laws of the distribution of plants and animals and the soils to which the plants are best adapted; and for the greater reason that it is charged, and always has been, with the purchase for distribution of improved and valuable seeds and plants.

This distribution of improved and valuable seeds and plants is based upon sound policy, because based upon natural law. A discussion of why this is so, and to what extent this power has been of value to the country, may be found in my article in the Report of 1890, referred to above. It is not desirable that this Department should dominate and control all the experiments carried on by the experiment stations, for the reason that no one man and no Department is large enough to comprehend the wants and the conditions of forty-eight States and Territories; but it is desirable that the Department should be fully posted in the experiments of the past, and should be thoroughly conversant with the experiments in the present, and should be such a well-equipped repository with reference to the results as to advise the stations and the country with reference to the same. By this means useless experiments and unnecessary duplication may be avoided, and the frittering away of this force, which may be of such great good to the country, may be prevented. It is no imputation on the zeal or energy of the stations, or in fact on the intelligence with which they are managed, to say that they are thrashing a great deal of old straw for want of the information that it has been thrashed before. It is not desirable that the Department should interfere with the details of the expenditures of the several stations, except in so far as to see that they follow the general and obvious lines of the legislation establishing them. The Department should have at least the right to inquire and report to Congress with reference to the administration of each of the stations, so that Congress in its annual appropriation may possess the information necessary for guidance in considering the desirability for its continuance. I believe that this will in time become a necessary requirement. It is certainly proper that when money is appropriated out of the National Treasury, the National Government should follow it to the extent of inquiring as to whether it has been properly expended, and there is no agent that is certainly more competent to do this and more

fully in sympathy with the labors of the stations than is the Department of Agriculture.

While it is the policy of this Department not to carry on field experiments itself, and that such should be remitted to the several experiment stations, it is very desirable that it should have such coöperation with the different stations as will enable it to use them in the making of such experiments as the information it possesses makes desirable. While I am not prepared to say that the stations should be compelled to make experiments indicated by this Department, it is desirable that in some way they should become the recognized agents of the Department in making such experiments. To a certain extent the Department at the present time is carrying forward such a line of coöperation, especially in the West and the South, relative to experiments with forage plants, and in sporadic cases requests have been made upon the stations for specific investigation and experiment. In these instances coöperation has generally been hearty, and the requests readily complied with, or the effort at least has honestly been made to do so; but such are the distractions of the workers in the various experiment stations, such the multiplicity of experiments being carried on and the pressure of local wants, that in many cases the request has been in the nature of an imposition of additional duties upon already overburdened shoulders, and in very many cases we feel that the results have not been such as they would have been if we had had sole charge of the experiments ourselves. Yet there has been enough of coöperation and results to justify us in the hope that in the future the sphere shall be enlarged, and that there shall be in the plan of every experiment station a definite place, and also the proper man or men, to carry on for us an experiment, if the same has not already been included in the general work of the station. It has always been my theory that these stations should in certain lines be the direct and responsible agents of the Department of Agriculture; that, having now the right to indicate lines of experiment and give advice to the stations, it should be afforded some means to enable it to see how to bring about results along such lines. Whether this can be more easily accomplished by affording this Department the means with which to pay for such experiments, coupled with the adjustment of the plans of the stations to perform them, or whether there shall be an element of directory power added to enforce this right to advise, now already possessed, is one of the debatable questions. I have been inclined to favor the first proposition. In that case the coöperation would be mutual, this Department affording the means and giving the advice, and the station including the work as a part of its plans. Occupying, as this Department does, the general field and looking the ground all over, it is or ought to be more competent to judge with reference to desirable lines of experiment for the whole country than any single station acting within its own sphere, and the means and facilities should be afforded for the joint work of these two great agencies of the country in agricultural investigation and experiment.

I can not think that it is desirable that this Department should inaugurate and carry out a general system of farmers' institutes. The effort to do so would break down from its own weight. These may be left largely to the control of the different States and localities and the different associations promoting them. It is desirable, however, that the Department should have a force of thoroughly skilled specialists, with the ability to participate in the discussions incident to these institutes. As a corollary to such a force the Department should be more fully equipped with the facts of each specialty than any other agency in the country. It should be competent, and it should be its duty, to give forth this information on points that shall supplement the equipment and the knowledge of the general institute workers, local or otherwise. So also with regard to the meetings of the various voluntary associations referred to which are devoted to special lines of agriculture. These, as well as the farmers' institutes, have a right to expect from the Department assistance of the character indicated.

I should be glad to have the officers of all associations established for the benefit of agriculture, or of any line of agriculture, bear in mind the fact that acquaintance must precede mutual service. The efficacy as well as the promptness of service to be rendered to such associations by the Department would be greatly aided were they promptly to place themselves in communication with the Department through their secretaries. Such information as the Department might have, calculated to be of special use to them, would then reach them directly, while they would otherwise have to obtain the same by special application as the result of learning indirectly that such information is to be had. On the other hand, so far as the Department itself is concerned, such local organizations furnish eminently proper channels through which not only to reach the more intelligent farmers, but through which information may be readily obtained by the Department and its workers in regard to local agricultural matters. This is at least a simple step towards the great work of coöperation, the necessity for which I have endeavored to show, and one the initiative of which must come from without, not from within, the Department; but I may be allowed to take this occasion to publicly express the readiness with which such a step in the direction of coöperation would be received by the Department.

After considerable study of the subject I am forced to the conclusion that it is not the function of this Department, by its publications, to take the place of the ordinary agricultural newspaper. All of the lines of information, historical or otherwise, which for the most part are well known, or which are current in every intelligent publication, should not as a rule be entered upon. The Department should not run a newspaper, at least in form and substance as now published. Its publications, as a rule, should cover its own work, which should be fully elaborated and clearly stated in language readily comprehended by the



average intelligent farmer, avoiding controversy, rejecting platitudes, and so far as possible repeating no fact generally known. "Farmers' bulletins," of huge editions, are liable to encroach, in my judgment, upon the domain of the agricultural newspaper. There is a clear distinction to be drawn, which with a little better understanding would be of great benefit to both sides in interest, and lead to a more hearty coöperation between the Department and the press. Still there are numerous publications demanded from this Department that occupy an intermediate station. Being the general repository of facts, and being in certain respects more thoroughly equipped than any other agency, there are special interests which may justly be covered by a Departmental bulletin. As a rule, however, they should be devoted to some specific purpose, and should contain within their pages the latest information on the subject obtainable by the Department. Covering the whole ground of the special inquiry, the constituent who may be specially interested in the subject is enabled to study it with more benefit than he could derive from following the sporadic articles or suggestions of the current newspaper. Occasionally it is desirable as a matter of economy on the part of the Department to issue a bulletin on subjects that are more or less treated of in the press. The correspondence of this Department shows that there are thousands and tens of thousands of letters annually received on the commonest and generally best known subjects. Each letter in due course has to be answered, sometimes briefly and sometimes requiring hours and days of preparation and compilation. In the administration of the Department and a proper classification of these general requests a brief bulletin or circular might be printed which would anticipate and answer perhaps one-half of such letters of inquiry. This plan is in no sense an attempt to invade the domain of the press. It should be used, as before stated, for the economical transaction of the business of the Department. This Department is a Department for the people, and every man who feels moved to ask a question or apply for information, however commonly known, is entitled to a courteous answer giving such information, and not referring him curtly to the ordinary avenues accessible to every intelligent reader or student. In the nature of the case these letters cover every possible known subject, and the correspondence entailed by them is one of the burdens which it is not desirable to unload; but the necessity for this class of circulars or bulletins need in no perceptible degree modify the policy of this Department to keep substantially within the limits of its own work in its publications. This work, however, it must be understood, is not always necessarily original work of which all the elements were heretofore unknown. Compilation of facts, classifying of information, adjustment of data, are just as much the work of the Department as the finding of a new remedy, a new plant, a new pest, or a new process. Hence the Department would be untrue to its obligations, would emasculate its virility, if it should abdicate any of



its functions for research or investigation, and every path that it is authorized to tread should lead to the widest horizon of publicity.

Finally, in order more effectually to carry out the foregoing suggestions, it is manifest that the Department should be more thoroughly equipped, even in the lines of limitation laid down. It should have a collection of cereals from all climates, classified, arranged, and studied by competent men; it should have models of all fruits, prepared with such discrimination as should show the effect of climate on their growth; it should have a complete collection of wools and other fibers scientifically arranged; it should have such a collection of every known product indigenous or adapted to all or any of our soils and climates; it should have a complete collection of all agricultural implements, arranged so as to show the development and historic progression of inventive genius as applied to agriculture; it should have a complete collection of soils, with their chemical analyses; it should have preserved in its museum or archives the visible result of every chemical analysis and every experiment, so far as it is possible to make it visible; it should carry to completion an exhaustive biological survey of the country, with special reference to the distribution according to climatic conditions of plants and animals, with a study of their adaptation to our varying soils and climates; it should have complete and reliable statistics of every agricultural product in the United States and of all competing products in foreign lands; it should count every hoof and estimate the value of every domestic animal; it should be in constant touch with the markets at home and abroad; it should know every pound of butter and cheese produced, and should be thoroughly versed in the processes for the best, the greatest, and most economical production of the same; it should know the locality and the spread of every pest and disease, and should thoroughly understand the remedies for and means of exterminating the same; it should have a sufficient force and sufficient means to carry into effect every operation and duty assigned to it; it should be equipped with persons competent to explain on the platform and to put into its publications the fullest, amplest, and latest information with reference to any agricultural specialty or interest in the United States. In other words, the Department of Agriculture should be so amply endowed with material, money, and men as should make it an authority on all agricultural questions, capable of assisting in every laudable way the experiment stations and colleges and all voluntary organizations, clubs, and associations. It should be a mine of information to the press; should be so established in the confidence of the people that these same people, in their respective localities, acting through their organizations and speaking through the press, would appreciate with growing interest the effort of their national agent; and should always be able and ready to coöperate with every other agent, to the mutual advantage of all.





